REMARKS

This communication is in response to an Office Action mailed 27 April 2007. A previous Office Action required Applicants to elect another single disclosed species for prosecution on the merits under 35 U.S.C. 121. In the response entered by the Office on February 23, 2007, Applicants elected the species of major histocompatibility (MHC) proteins as a final species of dopant molecules.

Claims 7-20, 25 and 26 are currently pending. Claims 7, 8 and 14 have been objected to; Claims 7-20, 25 and 26 are rejected. Claims 1-6 and 21-24 have been cancelled. Claims 7, 8 and 14 are currently amended.

Applicants thank the Examiner for entering the Request for Continued Examination and for the withdrawal of the anticipation rejections of the claims by Kam et al and Chen et al., and the withdrawal of the obviousness rejection over Chen et al. in view of Boxer et al.

Applicants note the new objections and rejections recited in the Office Action mailed 27 April 2007 and respond to each in turn. For the sake of clarity, the rejections and objections of the presently outstanding Office Action are set forth below, in the order in which they were presented and are herein addressed:

1. Claims 7, 8 and 14 are objected to for the use of multiple periods in the claim.
2. Claims 7-20, 25, and 26 stand "rejected under 35 U.S.C. 112, first paragraph, as containing subject matter allegedly not supported by written description.
3. Claims 7-20, 25, and 26 stand "rejected under 35 U.S.C. 112, second paragraph, as being indefinite.
4. Claims 7, 8, 10, 11, and 14-18 stand "rejected under 35 U.S.C. 102(b) as being anticipated by Dori et al, *Biomedical Materials Research*, Sept 7, 1999, p. 75-81.

I. Claims 7, 8 and 14 have been corrected.

Applicants have corrected the objection to the use of multiple periods in a claim and have corrected claims 7, 8, and 14 to recite parentheticals. Applicants request that this objection be withdrawn.

II. The claims do not contain new matter but are supported by written description.

The Office Action rejects the claims as containing new matter, specifically the Office Action alleges that "[t]he specification as filed does not appear to provide support for the limitation wherein cell interaction is a "natural interaction", as in independent claims 7 and 8," or for "the limitation wherein membrane elements retain "natural biologic activity," as in independent claim 14." Office Action, p. 4, paragraph 13. Without conceding to the rejection, and solely for the purpose of furthering Applicants' patent goals, Applicants have amended the claims thus rendering this rejection moot in regards to the term "natural."

With regard to the rejection of claims 14, in paragraph [0023], the specification describes that "The dopant may also be or include proteins that modulate cell adhesion. The fluid nature of the lipid bilayer of the present invention allows various membrane-bound proteins to be included in the bilayer while retaining their biological activity, including the ability to cluster and move about within the lipid bilayer artificial membrane." Furthermore, in paragraph [0032], "[t]he choice of dopant will depend on the type of cell and the cellular behavior being tested." Thus, as the specification describes as claimed in claim 14, the dopants used to direct cell interaction and adhesion, should retain their biological activity.

Applicants have amended the claims to recite a "functional cell-cell interaction." While the exact phraseology "cell-cell interaction" is not used verbatim in the specification, Applicants submit that claims as currently amended do not incorporate new matter and these limitations are supported by the specification as filed at, for example, pages 5-7 and 9. According to MPEP 2163.02, "The subject matter of the claim need not be described literally (i.e., using the same terms or *in haec verba*) in order for the disclosure to satisfy the description requirement. If a claim is amended to include subject matter, limitations, or terminology not present in the application as filed, involving a departure from, addition to, or deletion from the disclosure of the application as filed, the examiner should conclude that the claimed subject matter is not described in that application."

Applicants' amendment of the claims is to reflect that in Applicants' invention, the cells adhere to dopants in the lipid bilayer, thereby allowing cells to establish and maintain functional and natural biological interaction with the lipid bilayer. Furthermore, the dynamic lipid bilayer membranes closely model segments of intact cell walls, and thus the claimed methods are useful

for observing and establishing functional cell-cell interaction studies. See Exhibit A of record, written by the first named inventor, John (Jay) T. Groves, entitled "Learning the Chemical Language of Cell-Surface Interactions," *Sci STKE*. 2005 Sep 13;2005(301):pe45, which describes the differences between cell-cell and cell-ECM interactions.

The specification on page 9, provides in paragraph [0041] that "[T]hese membranes are designed to include dopants that modulate cell adhesion and growth characteristics. These dopants may be proteins used to provide an effective artificial cell surface, such as T-lymphocytes or neutrophils. The artificial cell surface may then be tested for cell adhesion properties and/or growth properties with a variety of test cells in culture. Numerous different cell surface properties may be modeled in a single micro-array." Examples of cell-cell interactions that can be observed are provided on page 5-7, such as, "to study lymphocyte-endothelial cell interactions,… the adhesion of lymphocytes within each well is assessed as to each corral. Adhesion is then correlated with the fraction added to the corral exhibiting membrane–lymphocyte binding..." Specification, paragraph 27. And further in paragraph [0029], a sample study of the activation of cytotoxic T lymphocytes (CTL) using a major histocompatability complex protein-doped membrane to mimic antigen presenting cells is described.

In light of the support in the specification pointed to above, Applicants request that the new matter rejection be withdrawn and the claims allowed.

III. The claims are definite.

The Office Action rejects the claims as indefinite, specifically the Office Action alleges that "[t]he term "natural interaction" in claims 7 and 8 render the claims indefinite," because the Office alleges that "The term "natural interaction" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of skill in the art would not be reasonably apprised of the metes and bounds of the claimed invention." Office Action, p. 5, paragraph 15. The Office further alleges that "the term "natural biologic activity" in claim 14 renders the claim indefinite" for the same reasons stated for the term "natural interaction." Ibid.

Without conceding to the rejection, and solely for the purpose of furthering Applicants' patent goals, Applicants have amended the claims thus rendering this rejection moot in regards to the term "natural." Applicants submit that specification supports and one having skill in the art

would understand amended claim 14 and the term "retain biological activity" to mean that the membrane composition elements retain their normal or native functional properties (e.g., as exhibited *in vivo*) for directing cell adhesion.

To further Applicants' patent and business goals Claims 7and 8 have been amended to better describe the functional cell-cell interactions that are created when the dopants direct cell adhesion to the membrane. Applicants submit that the term is definite and does not require "a standard for ascertaining the requisite degree." Furthermore, one of skill in the art would be reasonably apprised of the metes and bounds of the claimed invention as limited by "a functional cell-cell interaction." Applicants submit that the amendments to the claims render the claims definite.

IV. The claims are not anticipated by Dori et al.

Claims 7, 8, 10, 11, and 14-18 stand "rejected under 35 U.S.C. 102(b) as being anticipated by Dori et a;., Biomedical Materials Research, Sept 7, 1999, p.75-81. The Office Action alleges that Dori et al. "teaches cell adhesion to lipid bilayer membranes…said bilayers on mica supports are then placed in a plurality of submerged glass vials, which read on microarrays."

For a claim to be rejected under 35 U.S.C. 102(b) as being anticipated, each element and limitation must be taught. Referring now to the amended claims 7, 8 and 14, Applicants assert that Dori et al fails to teach each and every claimed limitation of the claims, specifically the limitation that *the dopants direct cell adhesion*.

Applicants submit that Dori et al. does not teach or suggest this claimed limitation. Dori et al used "the accessibility of a ligand … as a means to influence the cell behavior. Supported bioactive bilayer membranes were created by Langmuir–Blodgett (LB) deposition of either a pure poly(ethylene glycol) (PEG) lipid, having PEG head groups of various lengths, or 50 mol % binary mixtures of a PEG lipid and a novel collagen-like peptide amphiphile on a hydrophobic surface…Cell adhesion and spreading assays showed that the cell response to the membranes depends on the length difference between head groups of the membrane components. Cells adhere and spread on mixtures of the peptide amphiphile with the PEG lipids having PEG chains of 120 and 750 molecular weight (MW)." Dori et al., abstract, p.75,

emphasis added. As stated in Dori et al., "In this study we used a specific system with a unique peptide ligand, but we believe that the results of this study will be applicable to other systems and will help in the design of bioactive membranes in which selective masking of a ligand on a surface will be used as a means to control the response of cells." Dori et al, p.81, emphasis added.

In contrast, Applicants claimed method uses doping to direct or promote cell adhesion as opposed to masking to prevent cell adhesion. The membranes in Applicants' claimed method are freely accessible and mimic a cell's natural surface. The membrane surfaces in Dori et al, do not mimic natural lipid bilayers and require PEG lipids and peptide ligands bonded to the lipid head groups to control cell response. Thus, Applicants submit that Dori et al. does not teach or suggest this claimed limitation. Therefore, because Dori et al. does not anticipate and teaches away from the claimed invention, the rejection of claims 7, 8, 10, 11, and 14-18 should be properly withdrawn.

CONCLUSION

Accordingly, Applicants respectfully request prosecution of the pending claims in due course. A petition for an extension of time for one month is enclosed with the fee of $60. Applicants believe all fees necessary for this amendment are submitted herewith. If any additional fee is necessary for entry of this amendment, then Office is hereby authorized to deduct that charge from Deposit Account 120690. If a telephone conference would, in any way, expedite prosecution of this matter, the Examiner is encouraged to contact the undersigned at (510) 495-2456.

Date: 10 August 2007

Respectfully submitted,

/ Michelle S. Chew/

Michelle S. Chew
Reg. No. 50,456
Lawrence Berkeley National Laboratory
One Cyclotron Road, Mail Stop 90B0104
Berkeley, CA 94720
(510) 495-2456 (direct); (510) 486-7058 (office)